

ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

JAN 29 1995

In the Matter of)

Revision of the Commission's rules
to ensure compatibility with
enhanced 911 emergency
calling systems)

FEDERAL COMMUNICATIONS COMMISSION
CC Docket No. 94-0102
OFFICE OF SECRETARY

RM-8143

To: The Commission

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COMMENTS OF VANGUARD CELLULAR SYSTEMS, INC.

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SUMMARY

Vanguard supports the Commission's objective of ensuring broad availability of 911 and enhanced 911 services to users of wireline and wireless telephone networks whose health and safety may depend on 911 emergency service systems. Vanguard believes that all commercial mobile radio service (CMRS) providers should afford access to basic 911 services over their wireless systems as soon as reasonably practical. Ensuring enhanced 911 capabilities over mobile systems over time will also serve the public interest, and Vanguard therefore endorses the Commission's efforts to achieve this goal. However, difficult technical and financial constraints currently inhibit the implementation of certain enhanced 911 features on mobile systems, and these problems will need to be resolved over the next several years before advanced 911 capabilities become a reality. Consequently, the Commission should encourage the development of technical standards and cost-effective solutions for implementing enhanced 911 services in a wireless environment. The Commission should not, however, adopt rules or timetables that place an unreasonable burden on cellular or other CMRS carriers to implement enhanced 911 capabilities before standards work is complete and advanced technologies are ready to be deployed.

Vanguard supports the Commission's proposal for implementing 911 call priority, but respectfully urges that a minimum of 2 to 3 years will be needed for the establishment of standards so that 911 call priority mechanisms can be developed and implemented in a cost-effective way.

Vanguard supports the Commission's efforts to encourage progress in the development of sophisticated location technologies. While the Commission's 3-stage approach offers a feasible framework for implementing ALI, Vanguard submits that the proposed schedule is not sufficient and should therefore be extended.

Specifically, the Commission should require STEP I ALI features to be implemented in three years from the effective date of the order adopting new rules. STEP II ALI capabilities should not be required until five years from the order implementing new rules. Finally, the Commission should not adopt a specific timetable for implementing STEP III ALI but, instead, should announce that it will commence a further rulemaking, at the end of five years, regarding the implementation of STEP III ALI following conclusion of that further the proceeding.

Re-ring/call back features should be implemented as proposed in the Notice.

Until standards bodies and manufacturers have progressed toward developing functional products, it may be premature for the Commission to adopt specific requirements now for base and mobile equipment. Moreover, it may be premature for the Commission to adopt specific cut-off dates now to govern specific equipment requirements. Finally, to the extent equipment requirements are adopted for subscriber equipment, the Commission should "grandfather" subscriber equipment in existence at the time new requirements become effective.

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FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

In the Matter of)

CC Docket No. 94-102

Revision of the Commission's rules)
to ensure compatibility with)
enhanced 911 emergency)
calling systems)

RM-8143

To: The Commission

COMMENTS OF VANGUARD CELLULAR SYSTEMS, INC.

Vanguard Cellular Systems, Inc. ("Vanguard"), by its attorneys, hereby submits its comments for consideration in the above-referenced proceeding.^{1/}

Vanguard supports the Commission's objective of ensuring broad availability of 911 and enhanced 911 services to users of wireline and wireless telephone networks whose health and safety may depend on 911 emergency service systems. For reasons discussed below, Vanguard believes that all commercial mobile radio service (CMRS) providers should afford access to basic 911 services over their wireless systems as soon as reasonably practical. Ensuring enhanced 911 capabilities over mobile systems over time will also serve the public interest, and Vanguard therefore endorses the Commission's efforts to achieve this goal. However, difficult technical and financial constraints currently inhibit the implementation of certain enhanced 911 features on mobile systems, and these problems will need to be resolved over the next several

^{1/} Revision of the Commission's rules to ensure compatibility with enhanced 911 emergency calling systems, Notice of Proposed Rule Making in CC Docket No. 94-102, released October 19, 1994 (the "Notice").

years before advanced 911 capabilities can become a reality. Consequently, the Commission should encourage the development of technical standards and cost-effective solutions for implementing enhanced 911 services in a wireless environment. The Commission should not act too hastily, however, in adopting rules or timetables that place an unreasonable burden on cellular or other CMRS carriers to implement enhanced 911 capabilities before standards work is complete and advanced technologies are ready to be deployed.

I. INTRODUCTION

Vanguard is a major cellular carrier with a long term commitment to the cellular industry. It began its involvement in cellular in 1984 and today is one of the 20 largest cellular carriers in the country. Vanguard's cellular systems currently operate in 25 markets in the eastern half of the United States; cover a geographic area containing more than 7.4 million people; and provide service to more than 250,000 subscribers. Vanguard cellular networks today deploy approximately 170 cell sites in the aggregate. Consequently, Vanguard and its customers have a direct and decided interest in the outcome of this proceeding.

The Notice raises a host of issues concerning the provision of 911 and enhanced 911 services in two telecommunications contexts. First, it seeks comment on proposals for ensuring the compatibility of private branch exchanges (PBXs) and other dispersed private telephone systems with enhanced 911 emergency services. Second, it proposes rules that would require wireless services, in particular CMRS services that provide real-time voice capabilities, to include features that will make

enhanced 911 services available to mobile radio callers. These features include Station Number Identification (SNI), Automatic Location Information (ALI), Selective Routing (SR), and other features for 911 calls provided over wireless mobile units. In view of Vanguard's experience as a mobile communications carrier, these comments focus on the present and future compatibility of wireless systems with 911 and enhanced 911 services.

The telecommunications landscape in the United States is changing dramatically as wireless services continue to develop and expand, and this trend toward greater mobility will continue as personal communications services (PCS) and other new wireless technologies become available. As a provider of telecommunications services that enable people on the move to communicate more easily, Vanguard understands the important role that cellular and other mobile carriers can play in fostering public safety and health. Indeed, like most cellular carriers, Vanguard has experienced first-hand the important contributions mobile communications systems can make when mobile users have access to emergency 911 services.^{2/} Consequently, Vanguard believes that this rulemaking will afford an appropriate and timely vehicle for interested parties, including government representatives, the mobile communications industry, equipment manufacturers, public health and safety services, and the general public, to address ways in which the overall objectives set forth in the Notice can best be achieved.

^{2/} See Section II B, infra, for a discussion of instances where access to emergency 911 services on Vanguard and other cellular systems has aided persons in distress.

Vanguard currently provides access to 911 services in all of its cellular markets for Vanguard's home customers and for customers of other systems who roam in Vanguard markets. In Vanguard's experience, most of the cellular carriers with whom Vanguard has entered roaming agreements also provide access to 911 services for Vanguard customers when they are roaming on such other systems. Providing access to basic 911 services over mobile radio networks is now technically feasible and affordable, and Vanguard therefore believes that requiring all CMRS carriers to afford access to basic 911 services would serve the public interest. Accordingly, Vanguard supports the Commission's proposal on basic 911 availability and agrees that this dialing feature should be made available by CMRS networks within one year of the effective date of the order adopting new rules.

The Commission is rightly concerned about the inability of mobile radio systems to interface with enhanced 911 systems like those deployed in wireline networks. The practical reality, however, is that implementing certain enhanced 911 features, like detailed user location information, is presently not feasible given technical and cost considerations affecting the development of such enhanced 911 capabilities. Suggesting a progression of steps for implementing enhanced 911 capabilities is a valid approach for ensuring the development of enhanced 911 services over time. Vanguard believes that standards work is critical to developing state-of-the-art technologies that will perform well in a complex mobile environment, and for facilitating the manufacture of enhanced 911 hardware and software products that will be affordable. Vanguard supports the proposals for enhanced 911 services set forth in

the Notice, but certain of the proposed deadlines, particularly those relating to the implementation of advanced ALI, are not realistic given the current state of technology. Consequently, Vanguard recommends certain changes to the milestone dates proposed by the Commission because it believes more time will be needed to achieve the worthy goals set forth in the Notice.

Finally, Vanguard agrees that the Commission is not itself in a position to adopt extensive technical standards for enhanced 911 operations, and that industry standards-setting committees are better able to address the precise technical requirements that will govern the development of enhanced 911 capabilities. As the Notice observes, several standards bodies are capable of assuming this work, including committees sponsored by the Alliance of Telecommunications Industry Solutions (ATIS); The Telecommunications Industry Association (TIA); and research organizations such as Bell Communications Research (Bellcore). Moreover, given the active involvement of industry associations concerning 911 issues to date, Vanguard would expect the ongoing participation of CTIA, PCIA, APCO, NENA, NASNA and other groups throughout the standards development process.

II. THE COMMISSION'S PROPOSAL TO REQUIRE CMRS PROVIDERS TO AFFORD BASIC 911 AVAILABILITY IS REASONABLE AND SHOULD BE ADOPTED

Vanguard supports the Commission's proposal for requiring wireless systems to make basic 911 services available to mobile radio callers. Providing this dialing capability over wireless systems is currently feasible from a technical

standpoint and can be accomplished without imposing unreasonable financial hardship on any sector of the mobile communications industry.

A. Categories of Mobile Radio Services Subject to 911 and Enhanced 911 Compatibility Requirements

As an initial matter, the Commission seeks to define the categories of mobile radio services that should be subject to new 911 compatibility requirements. The Notice suggests mobile radio services offering access to real-time voice services provided on the public switched network as an appropriate definition. The Notice points out that 911 services today depend primarily on voice or voice equivalent (text telephone or TTY) communications, and that users of voice mobile radio services now reasonably expect to have access to emergency services through 911.

Vanguard agrees with the Commission that commercial mobile radio services (CMRS) providing real-time voice capability is the appropriate category of services that should be required to meet 911 compatibility requirements that are adopted as a result of this proceeding. This approach is sound for a number of reasons. First, to the extent users of existing voice mobile services, like cellular, have come to expect access to emergency services through 911, such expectations logically apply to all substantially similar mobile radio services regardless of the precise technology involved. Thus, user expectations regarding the ability to reach emergency services by dialing 911 on a mobile phone will be identical regardless of whether the underlying CMRS technology is cellular, PCS, wide-area SMR or other new mobile voice technology. It would therefore be entirely appropriate to apply

whatever 911 compatibility requirements ultimately are adopted uniformly to all CMRS systems providing real-time voice services.

Second, applying access requirements to CMRS systems that provide real-time voice services would broaden the availability of 911 services as technology changes and new service providers enter the mobile communications marketplace. The Commission's prime objective in this proceeding is to address ways to extend the availability of 911 and enhanced 911 services into new and changing technological environments. Adopting a "CMRS" definition would recognize the dynamic nature of today's mobile communications marketplace and ensure that substantially similar mobile services will implement 911 and enhanced 911 features on an equal and consistent basis.

Third, a consistent approach toward making 911 services available to all mobile radio callers -- regardless of the CMRS technology being used -- would avoid public confusion that would result if some CMRS systems were to afford access to 911 emergency services while others did not, or if a number of CMRS systems otherwise offering substantially similar services were subject to different 911 compatibility requirements.

Finally, using a "CMRS" definition is consistent with the goals the Commission sought to achieve in establishing the CMRS classification. Among other objectives, the Commission endeavored to create a symmetrical regulatory framework for commercial mobile radio services to ensure that similar mobile services are

accorded similar regulatory treatment.^{3/} Indeed, the concept of creating a "level regulatory playing field" for similar mobile services permeated the Commission's various proceedings in Docket 93-252 on the Regulatory Treatment of Mobile Services and related proceedings. Thus, to the extent mobile services compete or have the reasonable potential to compete in meeting the needs and desires of customers, they should generally be subject to similar technical and operational requirements. The Commission proposal for making all CMRS systems that provide real time voice services subject to 911 and enhanced 911 compatibility requirements is consistent with this regulatory framework.

As to how the proposed performance requirements, particularly phase-in periods, should apply to existing mobile systems (e.g., cellular) as compared to new systems (e.g., as PCS), Vanguard submits that the overriding regulatory objectives must be: (a) to expand 911 capabilities to new systems as soon as reasonably practical; and (b) to create a level regulatory playing field among competing mobile services. Accordingly, those 911 and enhanced 911 features that the Commission decides to implement must be applied uniformly to all CMRS systems providing real-time voice services, including applicable time frames when such requirements are to take effect.

^{3/} See Third Report and Order in GN Docket No. 93-252, Regulatory Treatment of Mobile Services, released September 23, 1994, at ¶ 23.

B. 911 Availability

The Joint Paper^{4/} recommends, and the Commission proposes, that a user have the ability to reach emergency services from any "service initialized" mobile radio handset in a home service area or a subscribed-to roamed service area by dialing only 911.^{5/} This means that any mobile radio transmitter that is service initialized on a radio network must be allowed to make a 911 call without a requirement for user validation. The Notice requests comment on the extent to which mobile radio services and equipment provide these capabilities today, the feasibility of implementing this feature, and the application of this feature to mobile radio handsets used on a "roaming" basis. The Commission proposes that this basic 911 dialing feature be made available one year after the effective date of the order adopting rules in this proceeding.

Vanguard strongly supports the Commission's proposal that mobile radio users should be able to reach emergency services in their home markets and while roaming by dialing only 911. Vanguard currently provides this dialing feature in each of its 25 cellular markets, both for Vanguard's home customers and for

^{4/} An "Emergency Access Position Paper" ("Joint Paper") was filed in the PCS proceeding by the Associated Public Safety Communications Officials-International, Inc. ("APCO"), the National Emergency Number Association ("NENA"), the National Association of State Nine One One Administrators ("NASNA"), and the Personal Communications Industry Association ("PCIA"). The Commission has based most of its proposals on the recommendations set forth in the Joint Paper. See Notice at ¶ 36.

^{5/} The Notice defines the term "service initialized" to mean "that the user has purchased services from a wireless service provider." Notice at ¶ 40, n. 46.

customers of other systems who are roaming in Vanguard markets. Based on its experience, most of the other cellular carriers with whom Vanguard has entered roaming agreements provide access to 911 services for Vanguard's customers while roaming on such other systems. Even in situations where Vanguard has terminated a customer for non-payment, or where a carrier with whom Vanguard has a roamer agreement is delinquent on its account, Vanguard systems will still recognize and honor 911 calls. Vanguard believes this approach is sound and consistent with the priority status that public health and safety communications should properly hold.

There are, of course, countless examples of how cellular systems have aided persons in distress because 911 services have been available to mobile customers. For example, a customer on Vanguard's Allentown, Pennsylvania system called 911 using his cellular phone after escaping from a burning apartment building. The quick arrival of firefighters led to rescue of the building's landlord, who had been trapped in the building and was unconscious when saved. Other cellular carriers have similar stories. For example, trade press reported that a postal service retiree from Dover, Delaware, called 911 on his cellular phone after he discovered a young man lying in a soybean field. Apparently the young man was bleeding and unconscious following an accident on his motorcycle, but thanks to quick thinking and use of cellular 911, a rescue team arrived in time to save the man's life. Of course, cellular phones also routinely assist in emergency situations on highways.^{6/}

^{6/} Vanguard and other cellular carriers have created special arrangements using abbreviated (continued...)

Given that basic 911 availability is technically feasible, can be implemented without undue financial hardship, and already has been implemented widely within the cellular industry, Vanguard believes the Commission's proposal for requiring this feature to be available within one year by all CMRS carriers providing real-time voice services is reasonable and should be adopted.

C. Grade of Service

Vanguard agrees with the view set forth in the Notice that federal standards concerning grade of service are not warranted at this time. The Joint Paper properly recommends that standards bodies should investigate technical solutions or other strategies to ensure minimal blocking of 911 calls from mobile radio transmitters. The Commission is correct, as a practical matter, that any overall grade of service objective must involve a cooperative effort among initiating, interconnecting and terminating systems. Grades of service within each system will be established depending on appropriate technical and economic considerations and, as such, this is not an area suitable for federal standardization. Accordingly, Vanguard agrees with the Commission's recommendation on grade of service issues.

6/ (...continued)

dialing schemes such as *11, to facilitate emergency communications between motorists and state highway patrols on major highways. These arrangements provide direct access to the public safety agencies responsible for these highways. Because of the unique benefits of these arrangements, they should be permitted to continue even after full implementation of mobile 911 services.

III. ENHANCED 911 FEATURES SHOULD BE IMPLEMENTED IN STAGES ONLY AFTER APPROPRIATE TECHNICAL STANDARDS HAVE BEEN ESTABLISHED

Vanguard believes that the Commission, by initiating this rulemaking, has properly focused attention on the need to improve, over time, the access of mobile radio customers to enhanced 911 services. Vanguard supports the objectives set forth in the Notice because ensuring the compatibility of wireless systems with enhanced 911 services will facilitate emergency communications and thereby promote public safety and health. These are important public interest objectives, and the Commission's overall goals in this proceeding deserve the support of the mobile communications industry, equipment suppliers, public safety associations, and other interested parties.

At the same time, however, Vanguard believes that certain of the Commission's proposals for implementing enhanced 911 capabilities are overly ambitious because they cannot feasibly be accomplished within the time frames suggested in the Notice. Indeed, factors influencing when enhanced 911 features can reasonably be achieved, including the current state of technology, a lack of standards in this area, and the anticipated high costs of implementing enhanced 911 features, suggest that a more realistic schedule should be allowed for implementing enhanced 911 services in the wireless environment.

Vanguard respectfully submits that all rules and timetables adopted by the Commission in this proceeding should adhere to the following fundamental principles:

First, enhanced 911 standards must be established by industry and standards-setting bodies before the Commission requires 911 features to be implemented over wireless networks. The development of standards will have a critical bearing on the implementation of enhanced 911 services from a number of standpoints, including the following:

- (1) Standards are needed to develop state-of-the-art technologies that will achieve the desired objective of making a variety of enhanced 911 services available in the mobile radio environment. There are many potentially competing location technologies, for example, but not all of them will function well or provide solutions to the unique complications surrounding mobile communications. Standards therefore are needed to ensure that enhanced 911 products and the networks on which they are installed will perform well in a dynamic context and will accommodate the requirements of mobile radio carriers, local exchange carriers, hardware and software suppliers, Public Safety Answering Points (PSAPs), and mobile system subscribers.
- (2) The development of standards is a key issue for equipment manufacturers because the existence of standards can substantially lower the cost of developing and manufacturing hardware and software.
- (3) Lower 911 equipment costs, in turn, can hasten the implementation of enhanced 911 services in wireless networks. Reduced 911 equipment costs are essential to mobile carriers, such as cellular operators, who will be required to install new equipment at cell sites throughout their systems to make them compatible with enhanced 911 services. Many cellular carriers, like Vanguard, are installing greater numbers of cell sites to meet customer demands, and this trend will only continue over time. Thus, installing enhanced 911 equipment at ever-increasing numbers of cell sites will be very expensive, and it is critical for mobile radio carriers that equipment and other costs associated with implementing enhanced 911 capabilities be minimized. Only a rational process that begins with the

establishment of technical standards can keep these costs within reasonable limits.

- (4) Finally, standards should be universal, a factor that is particularly important in mobile communications to enable users to access enhanced 911 services wherever they are located and wherever they travel. In addition, standards must be established to cover multiple Radio Frequency (RF) access schemes since analog and digital technologies will be coexisting in cellular systems for many years to come.

The development of new technical standards or, where appropriate, revisions to existing standards, often involves a lengthy process that can consume a minimum of 4 to 5 years.^{7/} Thus, any rules or timetables which the Commission adopts as a result of this proceeding must allow sufficient time for industry and standards setting bodies to complete the important task of establishing enhanced 911 standards.

A second basic principle to follow is that enhanced 911 features should be implemented in phases over time. The Commission has proposed, for example, to require the implementation of automatic location identification (ALI) in three steps. While the time frames suggested in the Notice are unduly ambitious, the proposal for a phased rollout of ALI features is a fundamentally sound approach that will permit the less difficult tasks to be accomplished relatively soon, while reserving more time for allowing standards and methods for implementing the more challenging 911 technologies.

^{7/} Longer periods are not unusual for complex technologies. For instance, the Commission's Advanced Television Committee has been considering ATV standards for more than five years and resolution likely is a year or more away.

Third, solutions for implementing enhanced 911 services must recognize that there exists a substantial base of mobile phones in operation today. There are approximately 20 million mobile phones being used currently in the United States, and this number is growing rapidly. Pending the development of standards, the industry does not know positively whether optimum solutions for implementing enhanced 911 services should concentrate on handsets or fixed network equipment or both. The enormous number of mobile handsets in operation suggests, however, that industry and standards bodies should strive for 911 solutions that focus exclusively or primarily on network infrastructure, rather than on subscriber equipment. To the extent standards bodies and manufacturers settle on enhanced 911 solutions that involve subscriber equipment, then handsets in existence should be "grandfathered" given the logistical task and expense that would be involved in recalling the enormous base of handsets already in use.

Fourth, FCC-mandated solutions for implementing enhanced 911 features must not impede important market trends toward smaller size and greater portability of mobile terminals. In cellular, for example, more and more customers are utilizing portable mobile phones rather than vehicular-mounted models. Vanguard's own experience is that more than 50% of its current sales are for portable phones rather than in-vehicle models. Moreover, as the Commission is aware, an important market trend in portable phone technology involves reductions in weight and size, thereby creating a more useful consumer product. A related technical development involves increasing battery life, thereby permitting more talk time.

Vanguard submits that requirements for implementing enhanced 911 services must take these important trends into account, and standards bodies must search for solutions that do not require changes in mobile terminals adversely affecting size, weight and battery life. Thus, the need to encourage greater portability (not less portability) in mobile communications also suggests that enhanced 911 solutions should focus exclusively or primarily on network infrastructure rather than on handsets, although that is a matter for standards committees to address.

Finally, enhanced 911 requirements must be implemented by the Commission in a way that minimizes costs for upgrading network equipment and, if subscriber equipment is involved in enhanced 911 solutions, minimizes costs for improvements to subscriber equipment. Keeping down costs is critical for mobile carriers, especially at a time when they are facing increased competition and are also making substantial capital expenditures to upgrade their networks to meet increasing demand and to convert to digital technologies. As noted above, the costs of implementing enhanced 911 services must be minimized by, among other things, encouraging the establishment of standards before requiring mobile carriers to implement enhanced 911 features; focusing on solutions that support existing subscriber equipment; and adopting timetables that are realistic and afford sufficient time for enhanced 911 standards to be established and implemented.

A. 911 Call Priority

The Commission proposes to require that, one year after the effective date of the rules adopted in this proceeding, originating 911 calls must be assigned

priority over non-emergency service calls. The Notice states that this priority would be assigned at the handset and would extend to placing the 911 call at the beginning of any queue for calls waiting to be placed in the mobile radio network. This priority would not require the interruption of calls in progress. The Commission seeks comment on the capability of existing systems to afford 911 call priority, and on the technical feasibility and costs of establishing priority for 911 calls in new and existing mobile radio networks.

Based on discussions with its equipment supplier, Vanguard can report that the cellular switches of its primary vendor possess 911 call priority mechanisms which permit 911 calls to be accorded priority once they reach the switch. The problem, however, is that there are no standards in existence today for affording priority to calls at a mobile handset and, accordingly, there is no way to assign priority to originating 911 calls from a handset to the receiving cell sites. Proprietary solutions for assigning priority to 911 calls at the handset probably can be developed, but these proprietary methods are not likely to be pursued by manufacturers in the absence of standards. Standards are needed so manufacturers can justify a commitment of resources necessary to develop 911 call priority solutions and so markets can develop for the sale of these new products. Thus, as a practical matter, standards work is required before 911 call priority features will become a reality. Implementing 911 call priority will require software modifications and possibly hardware modifications. Vanguard's equipment vendor could not speculate on costs for implementing 911 call priority in the absence of standards and without more

information regarding requirements which the FCC will ultimately adopt, but Vanguard believes that implementing 911 call priority over mobile networks will be expensive based on preliminary technology review.

In view of the foregoing, Vanguard supports the Commission's proposal for implementing 911 call priority, but respectfully submits that the one-year time period suggested in the Notice is not realistic given the need to establish standards for this purpose. Vanguard believes that a minimum of 2 to 3 years will be necessary for the establishment of new standards, or for revisions to existing standards, so that 911 call priority capabilities can be developed and implemented in a cost-effective way.

B. User Location Information

The Commission agrees with the Joint Paper that wireless systems ultimately should have the ability to identify the location of a wireless terminal used to make a 911 call. The Notice acknowledges that automatic location identification (ALI) is more difficult to accomplish in mobile radio networks because a caller can be anywhere in the network's service area. The Commission observes that current technologies can only approximate a caller's location and may be of minimal use to emergency service personnel, particularly in urban settings. The Commission also notes that, to obtain precise geographic location information, a PSAP may need to know not only the latitude and longitude of the mobile unit, but also its elevation in circumstances where the caller is in a high-rise building.

The Commission seeks comment on technical and cost considerations affecting the implementation of an ALI requirement that would include detailed location information. The Notice lists a variety of possible location methods for providing location data with varying levels of precision, observing that all of these methods raise issues regarding performance, cost or technical feasibility. In view of concerns expressed by manufacturers and communications service providers regarding the technical and financial feasibility of implementing detailed ALI, the Commission tentatively concluded that compliance with ALI requirements should be implemented over time in a 3-step process.

Vanguard agrees that incorporating ALI capabilities into mobile radio networks over time is desirable because the availability of ALI will assist the users of mobile communications systems in important ways. Vanguard therefore supports Commission efforts to encourage progress in the development of sophisticated location technologies. Location capabilities today, to the extent they exist at all, are crude technologies that are not particularly useful in providing precise location information. Given this fact, and considering the challenge of developing ALI technologies in a mobile setting, Vanguard believes that, as a first step, industry and standard bodies must be encouraged to establish technical standards that will ensure that ALI technologies that are ultimately deployed will be workable and affordable. While the Commission's 3-stage approach offers a feasible framework for implementing ALI, Vanguard submits that the proposed schedule for implementing ALI technologies is not sufficient, and the deadlines should therefore be extended in order to provide

enough time to complete standards work, conduct field trials, and perform other required tasks before deploying new ALI features in wireless networks.

Current ALI technologies reflect various levels of maturity and precision. Some are in development, others are being tested, but few, if any, are commercially available today. All of these methods, as acknowledged in the Notice, present problems, in varying degrees, relating to accuracy, affordability and implementation. As observed by the Commission, GPS does not work well in buildings or amid obstructions that attenuate or block satellite radio transmissions. Terrestrial radio triangulation methods are also hampered by interference and by signal reflection (multipath). Vectorization techniques today cannot accommodate various RF access schemes, especially digital technologies, yet current analog systems and new digital upgrades will both be present in cellular systems for many years to come. Moreover, there has been no resolution of even basic issues, such as whether ALI solutions should focus on upgrading network infrastructure or, alternatively, on modifications to subscriber equipment. To the extent ALI technologies would require changes in subscriber equipment, important questions affecting the evolution toward smaller devices and greater portability have not yet been resolved, including the impact of new ALI technologies on handset size, weight and battery life.

Nor have the costs of implementing ALI technologies been ascertained with any degree of accuracy. As cellular and other mobile carriers continue their system buildouts, increasing the number of cell sites, and as subscriber growth continues at a rapid rate, many of the possible location technologies will be extremely

expensive to implement.^{8/} Cost therefore becomes a critical factor for the Commission to weigh as it considers ALI requirements and appropriate time frames for enforcing those requirements.

All of these factors, both technical and financial, suggest strongly that ALI standards must be pursued before sophisticated ALI features can realistically be implemented in a wireless environment. Everyone understands that developing sophisticated location technologies for mobile systems, and ultimately deploying ALI capabilities with the desired level of precision, present difficult challenges that are not subject to easy or rapid solutions. Establishing technical standards, however, will help to foster creative, state-of-the-art technologies that hopefully will perform well in a mobile setting. Standard bodies must address, among other issues affecting cellular carriers, how ALI solutions will accommodate multiple RF access schemes, including CDMA, TDMA and AMPS. As noted earlier, developing standards as a priority matter will also help to lower the costs of implementing ALI, and this will benefit hardware and software manufacturers, landline and mobile systems carriers, PSAPs, and users of mobile communications.

Developing new ALI standards, or revising existing standards to improve ALI technologies, inevitably will take time. Implementing functional ALI

^{8/} In addition to the sheer number of cell site installations that would be involved in implementing advanced ALI, Vanguard notes that many cellular site leases prohibit the installation of additional equipment without the consent of the landlord, a fact that would preclude further installations or, at the very least, result in increased lease costs for installing further equipment.